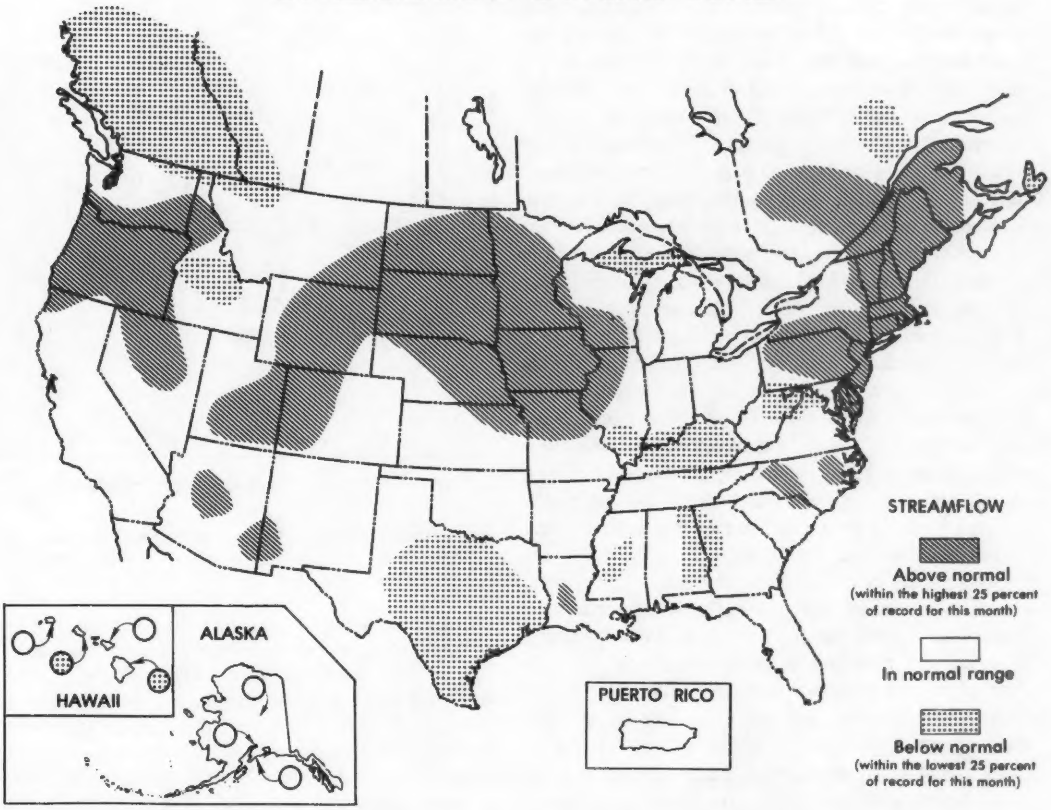
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

JUNE 1984

STREAMFLOW DURING JUNE

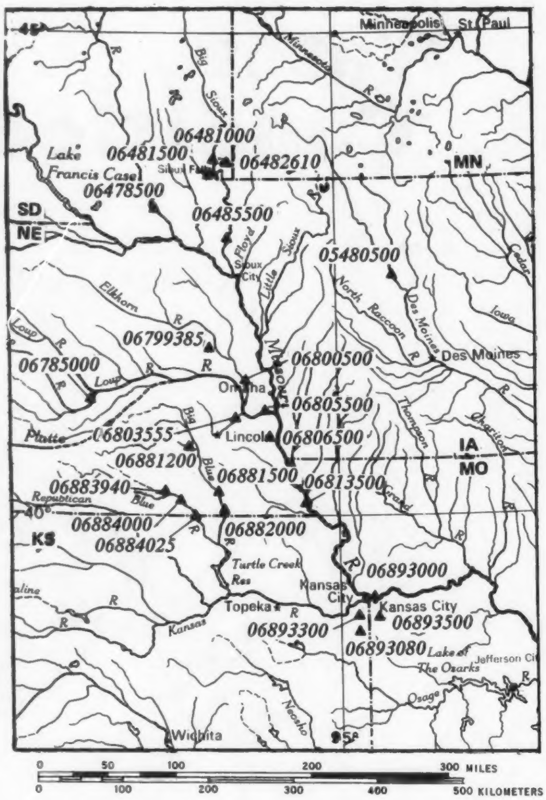


Streamflow was in the normal range or above that range in most of the United States and southern Canada during June. Below-normal flows persisted in two large areas, however, one in Texas and the other in and adjacent to British Columbia.

Severe flooding occurred in eastern Nebraska and parts of Iowa, Kansas, Missouri, and South Dakota, as a result of runoff from torrential rains that plagued the five-state area during the month. Storm and flood damage estimates ranged as high as one billion dollars in Iowa and the value of topsoil lost in Nebraska was estimated at $20 million. Monthly mean flows were highest of record for June in parts of at least 6 States. Flooding also occurred in parts of Idaho, Wisconsin, and several New England States.

STREAMFLOW CONDITIONS DURING JUNE 1984

Severe flooding occurred in eastern Nebraska and adjacent areas of southeastern South Dakota, western Iowa, northwestern Missouri, and northeastern Kansas as a result of runoff from torrential rains that plagued the 5-state area throughout the month. Storm and flood damage in 44 counties in Nebraska was estimated at \$94 million and the value of topsoil washed away was estimated at \$20 million. Similarly, in Iowa, flood damage to property and crops was estimated at one billion dollars. Peak flood discharges were highest of record at several stream-gaging stations in Kansas, Nebraska, and South Dakota. Selected data on stages, discharges, gaging station locations, and recurrence intervals are given in the accompanying table and map. Monthly mean and/or daily mean flows were highest of record for the month on some streams in Iowa, Kansas, Maine, Minnesota, Nebraska, Nevada, North Carolina, North Dakota, and South Dakota. (See table on page 4.) For example, in northeastern Kansas, the monthly mean discharge of 5,560 cubic feet per second (cfs) and the daily mean flow of 26,800 cfs on the 14th, were highest for June in 58 years of record on Little Blue River near Barnes (drainage area, 3,324 square miles). Similarly, the monthly mean flow of 15,200 cfs at Des Moines River at Fort Dodge, in northwestern Iowa, was highest for June in 52 years of record and flow at that site remained in the above-normal range for the 8th consecutive month. (See graph on page 5.) In Iowa, the majority of the flood flow was confined to the Missouri, Big Sioux, Nishnabotna, Skunk, and Des Moines River basins. The Saylorville and Red Rock Reservoirs, on the Des Moines River, were over or near maximum storage capacity.



Location of stream-gaging stations in Iowa, Kansas, Missouri, Nebraska, and South Dakota, described in table of peak stages and discharges.

Streamflows generally decreased seasonally in most areas east of the Mississippi River and in southwestern areas of the United States during June. Flows generally increased and remained in the above-normal range in parts of most States north and west of Missouri during the month. Monthly mean flows also remained in the above-normal range in parts of North and South Carolina, Quebec, and most northeastern States. Monthly mean flows increased but remained in the below-normal range at index stations in Alberta and British Columbia. Flows also remained in the below-normal range in parts of Hawaii, Nova Scotia, Texas, and Montana, and decreased into that range in parts of Alabama, Georgia, Idaho, Illinois, Kentucky, Michigan, Mississippi, Pennsylvania, Quebec, and West Virginia as a result of below-normal precipitation. Flows were lowest of record for June in parts of Idaho, Louisiana, and Texas. In Puerto Rico,

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Provisional data; subject to revision

FLOOD DATA FOR SELECTED SITES IN IOWA, KANSAS, MISSOURI, NEBRASKA, AND SOUTH DAKOTA, JUNE 1984

WRD station number	Stream and place of determination	Drainage area (square miles)	Period of known floods (years)	Maximum flood previously known			Maximum during present flood				
				Date	State (feet)	Discharge (cfs)	Date	Stage (feet)	Discharge		Recurrence interval (years)
									Cfs	Cfs per square mile	
IOWA											
	DES MOINES RIVER BASIN										
05480500	Des Moines River at Fort Dodge.	4,190	52	Apr. 8, 1965	17.79	35,600	June 19	14.80	28,300	6.8	10
	BIG SIOUX RIVER BASIN										
06485500	Big Sioux River at Akron.	9,030	56	Apr. 9, 1969	22.99	80,800	23	22.37	50,900	5.6	30
KANSAS											
	KANSAS RIVER BASIN										
06884025	Little Blue River at Hollenberg.	2,752	10	Oct. 12, 1973	23.07	(a)	June 13	20.93	33,000	12	(a)
	BLUE RIVER BASIN										
06893080	Blue River near Stanley.	46	14	June 9, 1974	16.83	7,500	9	18.90	14,200	309	(a)
06893300	Indian Creek at Overland Park.	26.6	21	Sept. 13, 1977	15.50	8,820	9	17.70	(a)	...	...
MISSOURI											
	MISSOURI RIVER MAIN STEM										
06893000	Missouri River at Kansas City.	485,200	87	June 16, 1844	38.0	625,000	June 11	25.00	240,000	0.5	50
	BLUE RIVER BASIN										
06893500	Blue River near Kansas City.	188	45	Sept. 13, 1961	44.46	41,000	9	37.30	25,000	133	20
NEBRASKA											
	PLATTE RIVER BASIN										
06785000	Middle Loup River at St. Paul.	8,090	77	June 23, 1947	12.69	72,000	June 12	6.40	29,500	3.6	25
06799385	Pebble Creek at Scribner.	204	6	Oct. 9, 1982	23.33	7,380	16	20.75	[b]20,300	100	(a)
06800500	Elkhorn River at Waterloo.	6,900	64	June 12, 1944	[c]16.6	100,000	18	18.12	42,650	6.2	25
06803555	Salt Creek at Greenwood.	1,051	33	June 24, 1963	23.46	41,000	13	26.70	48,000	46	25
06805500	Platte River at Louisville.	85,800	31	Mar. 30, 1960	12.45	124,000	14	11.34	144,000	1.7	100
	WEEPING WATER CREEK BASIN										
06806500	Weeping Water Creek at Union.	241	35	May 9, 1950	29.80	60,300	13	29.67	55,000	228	60
	KANSAS RIVER BASIN										
06881200	Turkey Creek near Wilber.	460	25	Mar. 28, 1960	14.92	7,300	13	19.89	20,000	43	>100
06881500	Big Blue River at Beatrice.	3,900	82	Oct. 12, 1973	33.02	49,100	14	31.43	[b]53,000	14	75
06882000	Big Blue River at at Barnston.	4,447	52	June 9, 1941	34.3	57,700	14	29.96	54,000	12	100
06883940	Big Sandy Creek at at Alexandria.	607	5	July 2, 1982	14.47	6,580	13	16.70	21,900	36	...
06884000	Little Blue River near Fairbury.	2,350	63	Oct. 12, 1973	18.96	37,800	13	16.98	42,000	18	50
	MISSOURI RIVER MAIN STEM										
06813500	Missouri River at Rulo.	414,900	35	Apr. 22, 1952	25.60	358,000	16	24.48	220,000	0.5	50
SOUTH DAKOTA											
	JAMES RIVER BASIN										
06478500	James River near Scotland.	21,550	56	Apr. 3, 1962	18.74	15,200	June 23	20.27	26,600	1.2	100
	BIG SIOUX RIVER BASIN										
06481000	Big Sioux River near Dell Rapids.	5,060	37	Apr. 9, 1969	16.47	41,300	21	15.0	14,500	2.9	15
06481500	Skunk Creek at Sioux Falls.	570	36	June 17, 1957	17.78	29,400	22	15.3	11,000	19	20
06482610	Split Rock Creek at Corson.	475	19	Apr. 8, 1969	15.00	17,800	22	13.97	14,400	30	40

[a]Not determined.
[b]Channel change.
[c]Site and datum then in use.

Provisional data; subject to revision

NEW EXTREMES DURING JUNE 1984 AT STREAMFLOW INDEX STATIONS

Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous June extremes (period of record)		June 1984			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
	HIGH FLOWS								
01014000	St. John River below Fish River, at Fort Kent, Maine.	5,690	58	21,800 (1947)	51,700 (1928)	17,142	181	53,400	1
01057000	Little Androscoggin River near South Paris, Maine.	76.2	63	464 (1917)	2,200 (1942)	359	349	2,260	1
02091500	Contentnea Creek at Hookerton, North Carolina.	729	56	1,594 (1979)	4,940 (1966)	1,238	354	5,300	5
05082500	Red River of the North at Grand Forks, North Dakota.	30,100	102	19,340 (1962)	26,500 (1962)	10,853	260	29,800	12
05330000	Minnesota River near Jordan, Minnesota.	16,200	50	17,260 (1944)	40,200 (1957)	20,690	361	39,600	28
05480500	Des Moines River at Fort Dodge, Iowa.	4,190	52	8,812 (1954)	34,000 (1954)	15,200	778	26,900	19
06485500	Big Sioux River at Akron, Iowa. . .	9,030	56	4,750 (1942)	20,100 (1954)	17,200	1,420	45,000	23
06800500	Elkhorn River at Waterloo, Nebraska.	6,900	64	11,530 (1967)	93,800 (1944)	11,950	640	40,800	18
06884400	Little Blue River near Barnes, Kansas.	3,324	58	3,843 (1967)	11,700 (1967)	5,560	774	26,800	14
10322500	Humboldt River at Palisade, Nevada.	5,010	77	3,104 (1971)	4,210 (1921)	4,640	432	6,600	2
	LOW FLOWS								
07378500	Amite River near Denham Springs, Louisiana.	1,280	46	452 (1963)	328 (1963)	626	82	285	24
08095000	North Bosque River near Clifton, Texas.	968	61	3.1 (1974)	0.0 (*)	0.31	0.4	0.0	(*)
08134000	North Concho River near Carlsbad, Texas.	1,249	60	0.0 (*)	0.0 (*)	0.00	0	0.0	(*)
13317000	Salmon River at White Bird, Idaho.	13,550	72	10,040 (1934)	5,430 (1931)	29,100	68	3,230	23

*Occurred more than once.

flows returned to the normal range following a prolonged drought and water shortages on that island.

Moderate flooding occurred in Massachusetts and Connecticut early in the month when peak flows on the Connecticut and Housatonic Rivers reached their third and fourth highest levels for period of record. The peak discharge of 194,000 cfs at Connecticut River at Hartford, Connecticut (drainage area, 10,487 square miles) on June 1, 1984, for example, was the third highest flow in 79 years of record, considerably less than the record high flow of 313,000 cfs that occurred on March 20, 1936.

In addition to the severe flooding in the upper Midwest, flood flows with recurrence intervals greater than 100 years occurred at several other locations in the Nation during June. For example, the peak flow of 13,600 cfs on June 7, 1984, in Lamoille River at Johnson, Vermont (drainage area, 310 square miles), was only 800 cfs less than the maximum in 56 years of record that occurred on July 1, 1973. Damage estimates exceeded one million dollars in Washington, Lamoille, and Franklin Counties in northern Vermont. In southwestern Wisconsin, the estimated peak discharge of 12,000 cfs on June 16, 1984, in Spring Coulee near Coon Valley (drainage area, 8.93 square miles), was nearly 4½ times the previous high flow of record at that site, the result of runoff from heavy rains in that area. Similarly, in east-central Idaho, the estimated peak discharge of 2,420 cfs on June 23, 1984, in Lemhi River near Lemhi (drainage area, 895 Square miles), was highest in 28 years of record and had a recurrence interval greater than 100 years.

In southwestern Minnesota, monthly mean discharges of the Chippewa River near Milan, Minnesota River at Montevideo, and Des Moines River at Jackson were highest for June in 47, 75, and 58 years of record, respectively. For several days, the flow from Chippewa River and Lac qui Parle River was so great flowing into Lake Lac qui Parle that the Minnesota River, which runs through Lake Lac qui Parle, flowed both upstream and downstream, simultaneously, out of Lake Lac qui Parle.

This phenomenon was caused by the erratic rainfall patterns which produced very little runoff in the Upper Minnesota basin until tributaries further downstream were at flood stage.

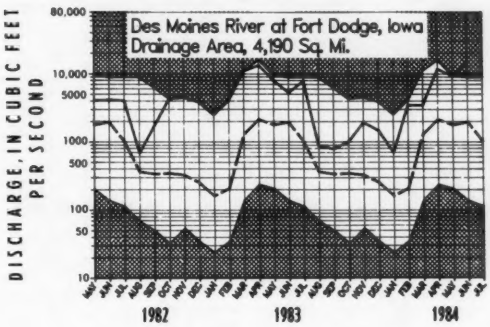
In Utah, the elevation of Great Salt Lake at end of June was 4,209.25 feet above sea level, only 2.25 feet below the elevation of 4,211.5 feet reached in 1873, the highest on record. The increase in elevation of the lake during June was slowed by warm, dry weather but the rising trend continued.

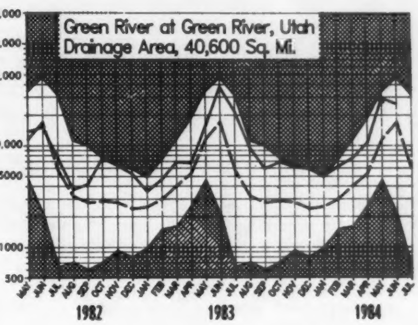
Contents of selected reservoirs in parts of Texas, Oklahoma, and New Mexico were below average at end of June. Elsewhere in the Nation and in southeastern Canada, near to well above-average reservoir contents were reported.

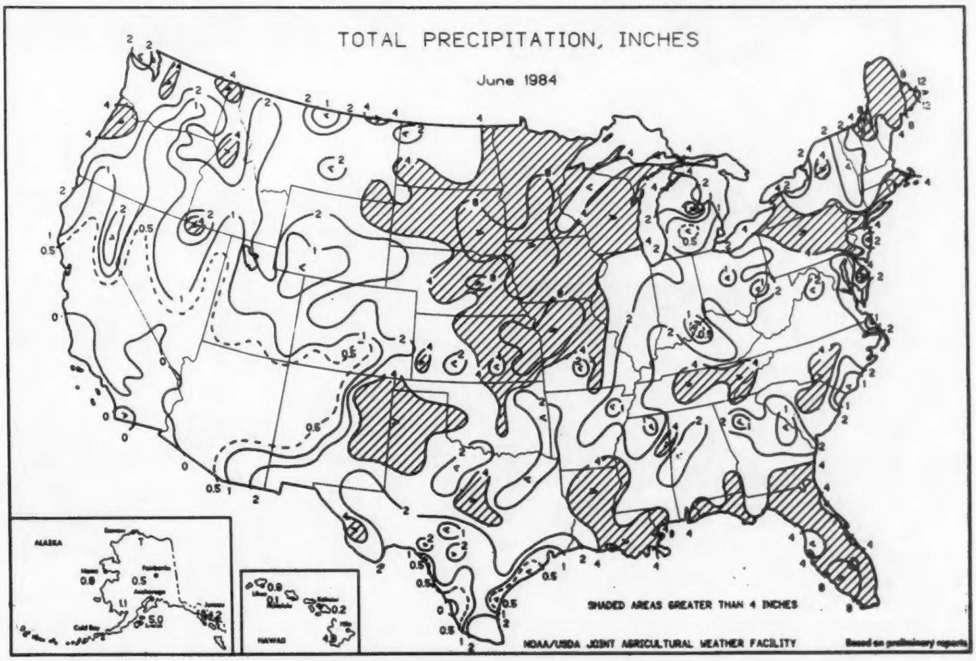
The combined flow of the three largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—was 1,800,670 cfs during June, 38 percent above the long-term average, but 14 percent below last month. The three large river systems, which includes the flow of the Ohio and Missouri rivers, account for runoff from more than half of the conterminous United States, and provide a quick, useful check on the status of the Nation's surface-water resources.

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.





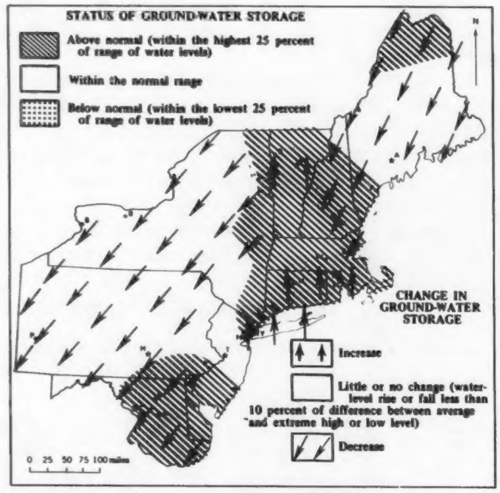


(From Weekly Weather and Crop Bulletin published by National Weather Service and Department of Agriculture.)

GROUND-WATER CONDITIONS DURING JUNE 1984

Ground-water levels continued to decline seasonally in most of Maine, New York, Pennsylvania, and Maryland. (See map.) However, levels rose in Rhode Island, eastern Connecticut, north-central Vermont, and on Long Island, New York. Levels near end of June remained above average in northern Maine, most of central and southern New England, and in Delaware, southern New Jersey, and central and eastern Maryland. Levels in some observation wells in southern New England were among the highest levels for end of June in the past 30 to 40 years.

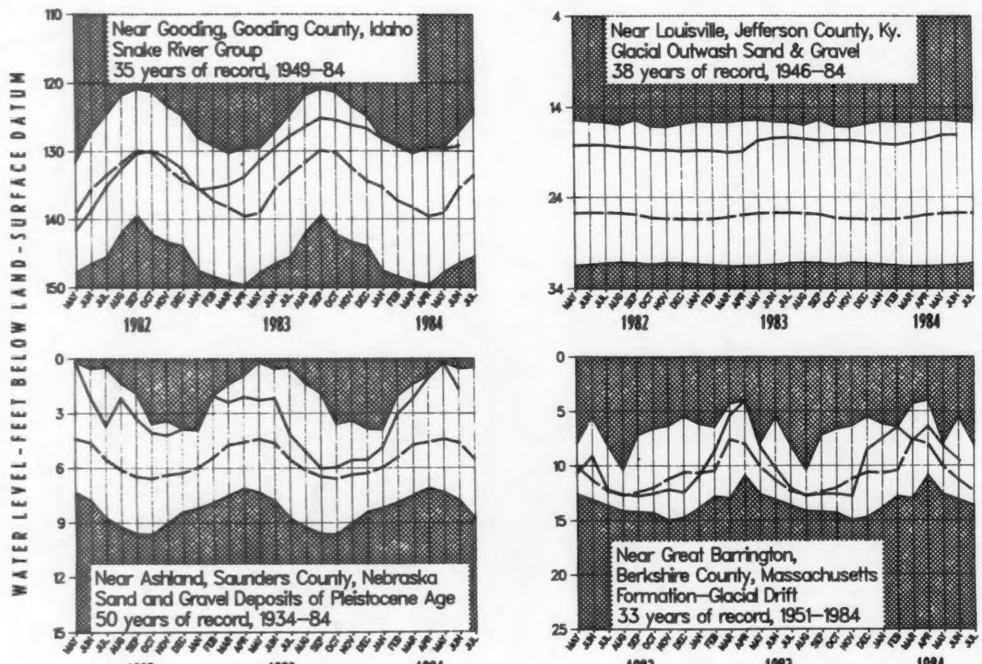
In the southeastern States, ground-water levels declined seasonally in West Virginia, Arkansas, Louisiana, and Mississippi. Trends were mixed in other States. Water levels were above average in Kentucky, Virginia, and North Carolina. Levels were above and below average in West Virginia and Louisiana; they were below average in Arkansas. New high levels, despite net declines for the month, occurred in Virginia and North Carolina; the



Map shows ground-water storage near end of June and change in ground-water storage from end of May to end of June.

MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



Provisional data; subject to revision

WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—JUNE 1984

Aquifer and location	Water level in feet with reference to land-surface datum	Departure from average in feet	Net change in water level in feet since: Last month	Last year	Year records began	Remarks
Glacial drift at Hanska, south-central *Minnesota*	−4.42	+1.24	−0.34	+0.61	1943	
Glacial drift at Roscommon in north-central part of Lower Peninsula, *Michigan*	−3.71	+0.50	+0.08	−0.55	1935	
Glacial drift at Marion, *Iowa*	−2.02	+2.22	+1.39	+2.36	1941	
Glacial drift at Princeton in northwestern *Illinois*	−7.46	+2.01	−0.28	+1.18	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, *Virginia*	−14.00	+1.42	−0.81	+0.85	1939	June high.
Glacial outwash sand and gravel, Louisville, *Kentucky* (U.S. well no. 2)	−17.08	+8.22	+0.01	+0.32	1946	
500-foot sand aquifer near Memphis, *Tennessee* (U.S. well no. 2)	−103.81	−15.31	+0.54	−2.31	1941	June low.
Granite in eastern Piedmont Province, Chapel Hill, *North Carolina*	−35.56	+5.85	−0.34	+2.81	1931	June high.
Sparta Sand in Pine Bluff industrial area, *Arkansas*	−231.00	−25.06	−4.80	+0.40	1958	
Eutaw Formation in the City of Montgomery, *Alabama* (U.S. well no. 4)	−20.0	+2.1	−2.3	−3.0	1952	
Limestone aquifer on Cockspur Island, Savannah area, *Georgia* (U.S. well no. 6)	−33.39	−6.85	−1.31	0.79	1956	
Sand and gravel in Puget Trough, Tacoma, *Washington*	−99.48	+10.81	+9.40	+0.91	1952	
Pleistocene glacial outwash gravel, North Pole, northern *Idaho* (U.S. well no. 3)	−454.3	+5.1	+0.8	+1.2	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, *Idaho*	−124.5	−5.6	+1.3	+2.1	1957	
Alluvial valley fill in Flowell area, Millard County, *Utah* (U.S. well no. 9)	−15.80	+29.94	+6.20	+28.20	1929	
Alluvial sand and gravel, Platte River Valley, Ashland, *Nebraska* (U.S. well no. 6)	−1.68	+2.84	−1.46	+0.48	1935	
Alluvial valley fill in Steptoe Valley, *Nevada*	−9.23	+3.73	−0.40	+0.48	1950	
Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern *Kansas*	−18.50	+1.88	+0.49	−1.00	1953	
Alluvium and Paso Robles clay, sand, and gravel, Santa Maria Valley, *California*	−97.36	+46.19	+0.37	+21.88	1957	Alltime high.
Valley fill, Elfrida area, Douglas, *Arizona* (U.S. well no. 15)	−110.5	−30.51	+0.1	+11.1	1951	
Hueco bolson, El Paso area, *Texas*	−263.84	−14.56	−1.93	−2.89	1965	Alltime low.
Evangeline aquifer, Houston area, *Texas*	−313.84	−16.64	−4.63	+5.32	1965	

level in the observation well near Memphis, Tennessee, rose slightly but was at a new June low.

In the central and western Great Lakes States, ground-water levels rose in Wisconsin, and mostly rose in Iowa. Trends were mixed in Minnesota and Michigan, and declined in Ohio. Ground-water levels were near or above average in Minnesota, Wisconsin, and Iowa, and in the normal range in Ohio. Levels were above and below average in Michigan. A new month-end high level for June was reached in Iowa.

In the western States, ground-water levels rose in Washington, in most of southern Idaho, and much of Utah and Arizona. Trends were mixed in southern California, Kansas, and New Mexico. Levels declined in North Dakota, Nebraska, Nevada, and Texas. Water levels were above average in Washington, Nebraska, and southern California. Levels were above and below average in Idaho, North Dakota, Nevada, Utah, Kansas, and New Mexico. Below-average levels occurred in Arizona and Texas. New high ground-water levels for June were recorded in Nevada and Utah, and a new low level for June was reported in Arizona. A new alltime high ground-water level was reached in southern California, in the Santa Maria Valley observation well, in 27 years of record. A new alltime high level also was reached in the key well in the Blanding area in Utah in 24 years of record. A new alltime low level was reached in El Paso, Texas, in 19 years of record. In addition, two alltime record levels in the western States were equalled: one, a high level, in Idaho, first reached in 1950, and the other, a low level, first reached in late 1983, in New Mexico.

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF JUNE 1984

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum: End of June 1984	End of June 1983	Average for end of June	End of May 1984	Normal maximum (acre-feet)[a]
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	86	76	71	91	[b]226,300
QUEBEC					
Allard (P)	88	87	83	87	280,600
Gouin (P)	94	98	68	79	6,954,000
MAINE					
Seven reservoir systems (MP)	99	95	87	103	4,098,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	91	92	90	97	76,450
Lake Francis (FPR)	90	84	87	87	99,310
Lake Winnipesaukee (PR)	105	99	96	126	165,700
VERMONT					
Harriman (P)	82	89	83	96	116,200
Somerset (P)	86	92	86	81	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	87	86	88	97	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	94	95	92	105	786,700
Indian Lake (FMP)	95	95	101	101	103,300
New York City reservoir system (MW)	96	96	...	100	1,680,000
NEW JERSEY					
Wanaque (M)	96	97	89	104	85,100
PENNSYLVANIA					
Allegheny (FPR)	55	47	48	52	1,180,000
Pymatuning (FMR)	101	116	98	105	188,000
Raystown Lake (FR)	68	63	62	68	761,900
Lake Wallenpaupack (PR)	82	85	85	91	157,800
MARYLAND					
Baltimore municipal system (M)	100	99	93	101	261,900
NORTH CAROLINA					
Bridgewater (Lake James) (P)	96	96	91	98	288,800
Narrows (Badin Lake) (P)	91	92	97	97	128,900
High Rock Lake (P)	87	84	79	91	234,800
SOUTH CAROLINA					
Lake Murray (P)	94	93	80	96	1,614,000
Lakes Marion and Moultrie (P)	87	83	76	89	1,862,000
SOUTH CAROLINA––GEORGIA					
Clark Hill (FP)	76	80	73	85	1,730,000
GEORGIA					
Burton (PR)	96	99	94	98	104,000
Sinclair (MPR)	91	89	90	97	214,000
Lake Sidney Lanier (FMPR)	65	67	65	67	1,686,000
ALABAMA					
Lake Martin (P)	99	99	92	99	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	70	71	61	78	2,229,300
Douglas Lake (FPR)	85	83	68	92	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	92	85	81	95	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	79	82	68	71	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	95	91	83	97	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	89	91	87	92	365,000
Wisconsin River (21 reservoirs) (PR)	86	91	82	87	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	37	37	39	29	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	95	89	92	87	22,700,000
SOUTH DAKOTA					
Angostura (I)	95	95	90	95	127,600
Belle Fourche (I)	94	84	71	96	185,200
Lake Francis Case (FIP)	93	84	83	85	4,834,000
Lake Oahe (FIP)	100	97	...	96	22,530,000
Lake Sharpe (FIP)	100	100	100	100	1,725,000
Lewis and Clarke Lake (FIP)	81	93	88	79	477,000
NEBRASKA					
Lake McConaughy (IP)	91	97	80	86	1,948,000
OKLAHOMA					
Eufaula (FPR)	100	102	96	104	2,378,000
Keystone (FPR)	97	103	106	101	661,000
Tenkiller Ferry (FPR)	104	105	102	109	628,200
Lake Altus (FIMR)	43	82	71	50	133,000
Lake O'The Cherokees (FPR)	99	95	96	102	1,492,000
OKLAHOMA––TEXAS					
Lake Texoma (FMPRW)	91	100	101	91	2,722,000
TEXAS					
Bridgeport (IMW)	64	87	53	68	386,400
Canyon (FMR)	86	94	81	87	385,600
International Amistad (FIMPW)	81	80	82	63	3,497,000
International Falcon (FIMPW)	27	39	67	32	2,668,000
Livingston (IMW)	98	101	89	101	1,788,000
Possum Kingdom (IMPRW)	76	96	99	79	570,200
Red Bluff (PI)	14	13	26	13	307,000
Toledo Bend (P)	94	98	92	98	4,472,000
Twin Buttes (FIM)	14	31	31	17	177,800
Lake Kemp (IMW)	88	87	93	91	268,000
Lake Meredith (FWM)	39	52	38	39	796,900
Lake Travis (FIMPRW)	57	94	82	63	1,144,000
MONTANA					
Canyon Ferry (FIMPR)	98	96	95	88	2,043,000
Fort Peck (FPR)	90	87	90	87	18,910,000
Hungry Horse (FIPR)	94	99	94	74	3,451,000
WASHINGTON					
Ross (PR)	89	91	90	48	1,052,000
Franklin D. Roosevelt Lake (IP)	94	94	101	46	5,022,000
Lake Chelan (PR)	90	100	96	47	676,100
Lake Cushman (PR)	102	102	98	96	359,500
Lake Merwin (P)	105	101	105	105	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	99	89	89	83	1,235,000
Coeur d'Alene Lake (P)	98	102	84	124	238,500
Pend Oreille Lake (FP)	94	99	98	74	1,561,000
IDAHO––WYOMING					
Upper Snake River (8 reservoirs) (MP)	96	95	85	87	4,401,000
WYOMING					
Boysen (FIP)	90	106	89	77	802,000
Buffalo Bill (IP)	107	105	102	79	421,300
Keyhole (F)	47	35	52	41	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	92	99	64	89	3,056,000
COLORADO					
John Martin (FIR)	55	47	19	53	364,400
Taylor Park (IR)	101	81	94	63	106,200
Colorado–Big Thompson project (I)	98	89	75	88	722,600
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	100	104	...	91	31,620,000
UTAH––IDAHO					
Bear Lake (IPR)	98	99	71	90	1,421,000
CALIFORNIA					
Folsom (FIP)	94	100	89	97	1,000,000
Hetch Hetchy (MP)	101	100	82	100	360,400
Isabella (FIR)	70	110	52	69	568,100
Pine Flat (FI)	89	90	73	93	1,001,000
Clair Engle Lake (Lewiston) (P)	100	100	90	97	2,438,000
Lake Almanor (P)	105	103	67	107	1,036,000
Lake Berryessa (FIMW)	93	98	85	96	1,600,000
Millerton Lake (FI)	87	100	83	96	503,200
Shasta Lake (FIPR)	94	103	87	98	4,377,000
CALIFORNIA––NEVADA					
Lake Tahoe (IPR)	93	68	74	84	744,600
NEVADA					
Rye Patch (I)	97	95	71	90	194,300
ARIZONA––NEVADA					
Lake Mead and Lake Mohave (FIMP)	94	99	74	93	27,970,000
ARIZONA					
San Carlos (IP)	69	62	18	75	1,073,000
Salt and Verde River system (IMPR)	77	92	48	82	2,019,100
NEW MEXICO					
Conchas (FIR)	63	88	80	64	330,100
Elephant Butte and Caballo (FIPR)	69	57	32	64	2,453,000

[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

Provisional data; subject to revision

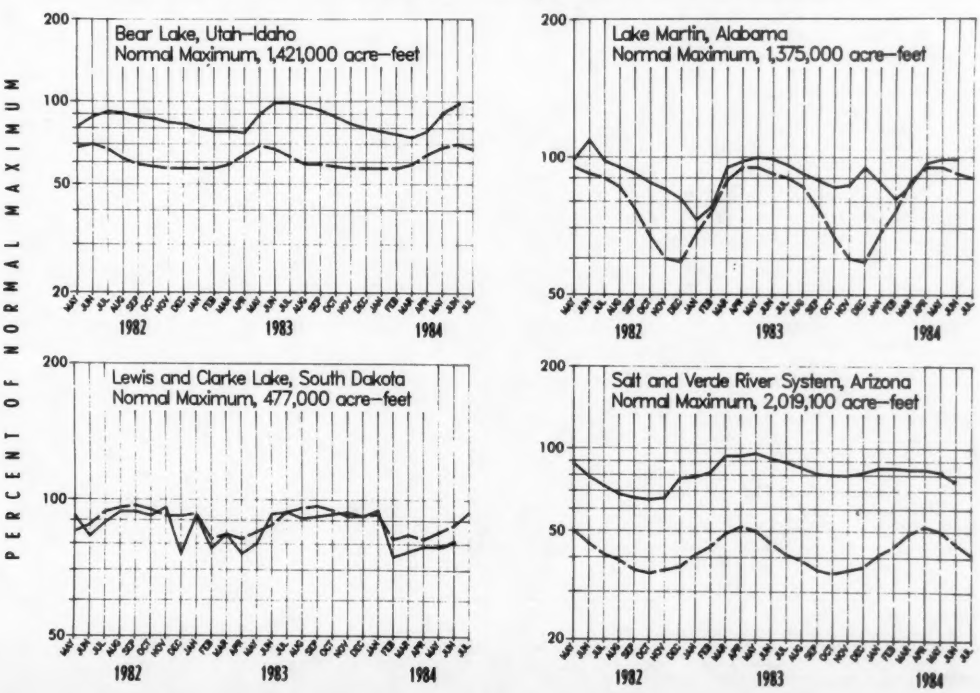
DISSOLVED SOLIDS AND WATER TEMPERATURES, JUNE 1984, AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	June data of following calendar years	Stream discharge during month	Dissolved-solids concentration[a]		Dissolved-solids discharge[a]			Water temperature[b]		
			Mean (cfs)	Minimum (mg/L)	Maximum (mg/L)	Mean	Minimum	Maximum	Mean, in °C	Minimum, in °C	Maximum, in °C
						(tons per day)					
01463500	Delaware River at Trenton, N.J. (Morrisville, Pa.)	1984	18,350	62	124	4,200	1,970	16,100	21.5	13.5	26.0
		1945–83	9,516	60	143	....	495	22,100	...	13.5	34.0
		(Extreme year)		(1945)	(1965)		(1965)	(1973)			
			c7,176								
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, N.Y. (median streamflow at Ogdensburg, N.Y.)	1984	309,000	165	166	138,000	137,000	139,000	15.5	11.0	19.0
		1976–83	304,000	165	171	136,000	110,000	250,000	15.0	11.5	19.0
		(Extreme year)		(1981–83)	(1981)		(1977)	(1981)			
			c280,200								
07289000	Mississippi River at Vicksburg, Miss.	1984	926,000	215	301	619,000	454,000	837,000	25.0	21.5	28.0
		1976–83	714,800	176	316	286,000	34,400	579,000	25.0	17.0	31.0
		(Extreme year)		(1981)	(1976)		(1978)	(1979)			
			c546,500								
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill. (streamflow station at Metropolis, Ill.)	1984	211,700	145	208	....	51,300	225,000	...	20.0	26.5
		1955–83	222,400	111	300	....	27,000	731,000	...	16.5	30.5
		(Extreme year)		(1974)	(1970)		(1977)	(1983)			
			c175,700								
06934500	Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.)	1984	212,000	234	456	169,000	120,000	215,000	24.5	19.5	28.0
		1976–83	113,400	207	448	98,000	44,000	188,000	24.0	19.0	28.0
		(Extreme year)		(1977)	(1980)		(1977)	(1983)			
			c86,260								
14128910	Columbia River at Warrendale, Oreg. (streamflow station at The Dalles, Oreg.)	1984	340,000	79	89	76,300	63,600	87,300	14.5	13.5	16.5
		1976–83	265,100	61	107	56,000	19,100	103,000	15.5	12.5	19.5
		(Extreme year)		(1976)	(1977)		(1977)	(1983)			
			c481,150								

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 × °C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comparison with data for current month.

USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS, MAY 1982 TO JUNE 1984

Dashed line indicates average of month-end contents. Solid line indicates current period.

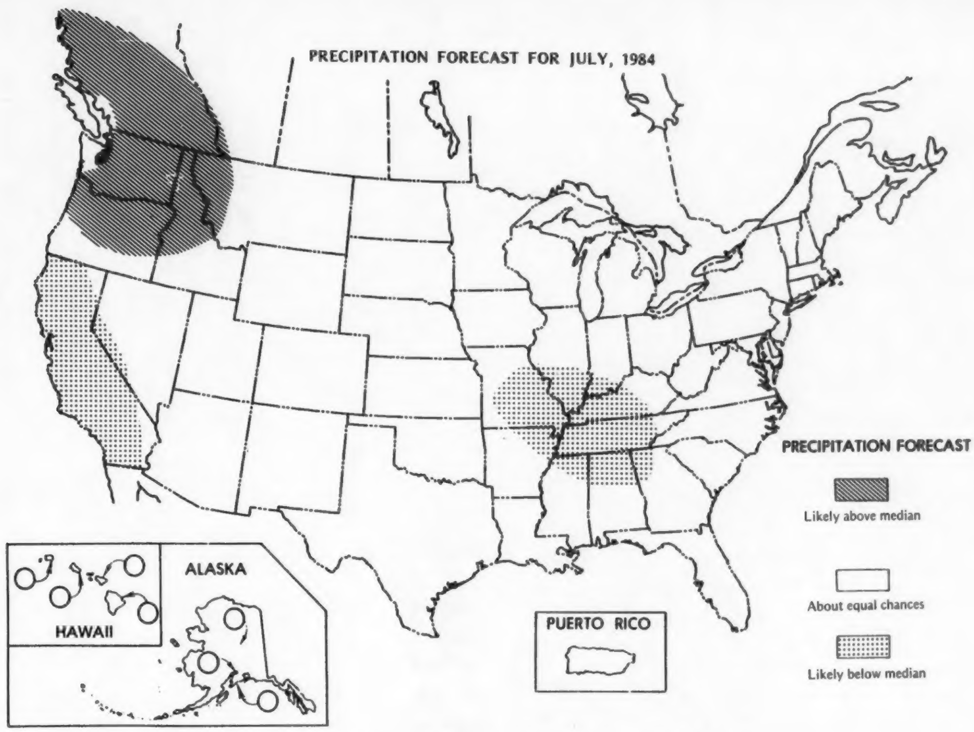


Provisional data; subject to revision

FLOW OF LARGE RIVERS DURING JUNE 1984

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	June 1984: Monthly mean discharge (cubic feet per second)	June 1984: Percent of median monthly discharge, 1951–80	June 1984: Change in discharge from previous month (percent)	June 1984: Discharge near end of month: Cubic feet per second	June 1984: Discharge near end of month: Million gallons per day	June 1984: Discharge near end of month: Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	17,142	181	–63	15,000	9,700	30
01318500	Hudson River at Hadley, N.Y	1,664	2,909	3,000	145	–51	1,200	780	30
01357500	Mohawk River at Cohoes, N.Y	3,456	5,734	4,210	160	–66	1,100	710	30
01463500	Delaware River at Trenton, N.J	6,780	11,750	20,270	282	–23	6,060	3,916	30
01570500	Susquehanna River at Harrisburg, Pa	24,100	34,530	45,000	241	–17	25,100	16,220	30
01646500	Potomac River near Washington, D.C.	11,560	[1] 11,490	6,020	79	–70	4,750	3,070	30
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	4,600	181	–4	2,000	1,300	30
02131000	Pee Dee River at Peedee, S.C	8,830	9,851	11,900	155	–17	6,680	4,317	28
02226000	Altamaha River at Doctortown, Ga	13,600	13,880	9,795	128	–61	5,150	3,328	27
02320500	Suwannee River at Branford, Fla	7,880	6,987	8,090	153	–51	6,600	4,270	29
02358000	Apalachicola River at Chattahoochee, Fla	17,200	22,570	17,000	106	–44	12,700	8,210	28
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala	15,400	23,300	5,756	79	–89	4,950	3,199	29
02489500	Pearl River near Bogalusa, La	6,630	9,768	3,238	81	–73	3,220	2,081	30
03049500	Allegheny River at Natrona, Pa	11,410	[1] 19,480	29,820	318	–27	50,600	32,700	30
03085000	Monongahela River at Braddock, Pa.	7,337	[1] 12,510	3,952	66	–71	2,750	1,777	21
03193000	Kanawha River at Kanawha Falls, W. Va	8,367	12,590	5,791	82	–75	5,110	3,302	28
03234500	Scioto River at Higby, Ohio	5,131	4,547	(*)	...	...	.....	.....	...
03294500	Ohio River at Louisville, Ky[2]	91,170	116,000	82,300	131	–63	82,300	53,190	27
03377500	Wabash River at Mount Carmel, Ill	28,635	27,220	22,900	111	–54	13,100	8,470	28
03469000	French Broad River below Douglas Dam, Tenn	4,543	6,798	6,006	112	–58	.....	.....	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis[2]	6,150	4,163	4,835	133	+6	5,275	3,409	27
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3]	299,000	242,700	309,470	110	+1	308,000	199,100	28
02NG001	St. Maurice River at Grand Mere, Quebec	16,300	25,150	40,000	136	–38	15,600	10,080	29
05082500	Red River of the North at Grand Forks, N. Dak	30,100	2,551	10,853	260	+186	6,250	4,039	25
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	25,800	125	+71	24,200	15,640	25
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	20,690	361	+18	39,600	25,590	28
05331000	Mississippi River at St. Paul, Minn	36,800	[1] 10,610	47,437	282	+26	68,300	44,140	23
05365500	Chippewa River at Chippewa Falls, Wis.	5,600	5,100	4,957	94	–46	3,300	2,130	30
05407000	Wisconsin River at Muscoda, Wis	10,300	8,617	12,372	126	–18	11,595	7,494	30
05446500	Rock River near Joslin, Ill	9,551	5,873	9,910	170	+1	9,700	6,270	30
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	142,050	167	–13	189,800	122,670	30
06214500	Yellowstone River at Billings, Mont	11,796	7,038	23,940	82	+79	33,500	21,650	30
06934500	Missouri River at Hermann, Mo	524,200	79,490	212,500	246	+3	237,000	153,200	29
07289000	Mississippi River at Vicksburg, Miss[4]	1,140,500	576,600	926,000	169	–36	692,000	447,300	25
07331000	Washita River near Dickson, Okla.	7,202	1,368	1,081	82	+69	556	359	26
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex	9,730	725	1,911	263	–44	1,200	780	30
09315000	Green River at Green River, Utah	40,600	6,298	27,197	159	–7	18,500	11,960	30
11425500	Sacramento River at Verona, Calif	21,257	18,820	11,700	103	–1	13,900	8,980	28
13269000	Snake River at Weiser, Idaho	69,200	18,050	59,100	244	–3	49,440	31,953	26
13317000	Salmon River at White Bird, Idaho	13,550	11,250	29,100	68	–5	3,840	2,481	27
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	55,100	137	+25	44,950	29,051	27
14105700	Columbia River at The Dalles, Oreg[5]	237,000	193,100	565,200	117	+64	345,300	223,170	26
14191000	Willamette River at Salem, Oreg.	7,280	23,510	31,400	260	+1	19,000	12,300	26
15515500	Tanana River at Nenana, Alaska	25,600	23,460	(*)	...	...	.....	.....	...
08MF005	Fraser River at Hope, British Columbia	83,800	96,290	226,337	91	+123	276,477	178,691	29

[1] Adjusted.
[2] Records furnished by Corps of Engineers.
[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.
* Data not available for June.



(From Monthly and Seasonal Weather Outlook Published by National Weather Service)

NATIONAL WATER CONDITIONS

JUNE 1984

Based on reports from the Canadian and U.S. Field offices; completed July 11, 1984

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The National Water Conditions is published monthly. Subscriptions are free on application to the National Water Conditions, U.S. Geological Survey, MS 419, Reston, Virginia 22092.

EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile). Shorter reference periods are used for the Puerto Rico index stations because of the limited records available.

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for June are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

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